Ph.D. Synopsis

On

Causal Relationship Study of Foreign Direct Investment, Trade and Economic Growth in BIMSTEC Nations

Submitted for Registration in

Doctorate of Philosophy in Business Management

Research Supervisor:
Dr. Vijender Pal Saini
Assistant Professor
HSB, GJUS&T
Hisar

Submitted by
Ravinder
Research Scholar
Roll No. 190100090143

HARYANA SCHOOL OF BUSINESS
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR- 125001

(October, 2020)

Contents

Sr. No.	PARTICULAR	PAGE NO.
1	Introduction	02
2	About BIMSTEC	05
3	Review of Literature	06
4	Research Gap	18
5	Objectives of the Study	19
6	Research Methodology	20
7	Relevance of the Study	21
8	Organisation of the Study	22
9	References	22
10	Table 1.1	04
11	Table 1.2	18

Topic of Research

Causal Relationship Study of Foreign Direct Investment, Trade and Economic Growth in BIMSTEC Nations

1. Introduction

The relationship between foreign direct investment and economic growth has been widely debated and burning topic since last three decades. In the present era of economic integration, no country can remain into isolation. Each and every aspect of every economy is associated with the other economies. This association leads to interdependence among economies in the various fields of economy. There are various factors which promote economic integration and among all those international trade holds more importance. All the resources of production are not available equally in every country. For fulfilling the needs, the countries engage in international trade and agreements. International trade and linkage enable countries to develop rapidly and utilizing resources efficiently. This process of increasing economic integration and interdependence among countries is known as globalization (Kumar, 2016).

International institutions like, IMF, World Bank, UNCTAD etc. are taking initiative to achieve balanced and sustained economic growth in developed as well as developing countries. Countries invite foreign flows to develop and properly utilize their resources efficiently. Rapid growth of an economy might attract more FDI by multi-national companies (MNCs), as they locate new profit opportunities (Hansen and Rand, 2006). Developing countries around the world have been the recipients of FDI since few decades. However, these countries require large inflow of FDI to accelerate their economic growth. FDI is considered an engine for economic development and one of the major sources of technology transfer from technology-advanced countries to technology-deficient ones. FDI contribute in the enhancement of economic development through employment generation, rising capital formation, increasing economy's productive capacity, improving managerial and technical skills, increasing factor's productivity, enhancing competitiveness and fostering macroeconomic stability in the host country (Kumari & Sharma, 2017). According to Somwaru and Makki (2004) growth can be enhanced by FDI if FDI results in increasing production through spillovers and technological transfers via diffusion processes. Moreover, in recent years, competition for attracting FDI among developing and developed countries has increased significantly.

The technology transfer due to FDI can take place through four modes: transfer of new technologies and ideas, technology imports, adoption of foreign technology and level of human capital (Miankhel et al., 2009). The governments of host countries provide many incentives to

foreign investors in order to attract them such as reduction in taxes and provision of subsidies etc (Shittu et al., 2020). Developing countries around the world are liberalising their policies to attract and facilitate more FDI and regulate FDI operations. Countries from South East and South-East Asian countries are taking many steps to increase inflow of foreign investment in their countries. Most of the developing and Least Developed Countries are lacking in technological proficiency. FDI facilitates the transfer of new technology and helps in minimising the technological gap between developing and developed countries (Kumari & Sharma, 2017; Adhikary, 2017).

FDI helps host countries in many other ways also. For example, contribution in GDP, facilitates in maintaining a healthy balance of balance of payments (BOP) account, increases job opportunities etc. However, the extent of benefits experienced by a host country due to FDI depends on its own economic growth. The growth-led FDI hypotheses states that when a country's economic growth increases its market size increases, which in turn encourage more foreign firms to invest more in that country (Adhikary, 2017; Andraz & Rodrigues, 2009). Thus, rapid growth of host countries, better infrastructure and greater opportunities for making profits invite more FDI and serve as greater incentives. Therefore, bidirectional relationship may exist between FDI and economic growth (Mishra & Jena, 2019; Miankhel et al., 2009). Thus, FDI contribute to economic growth of host countries which in turn invite more FDI to these countries. Many developing countries have gradually emerged as a regional and global engine of growth over the last two decades and are witnessing higher growth in world trade and economic growth. These factors have led many developed countries to invest in such countries due to regional benefits associated in such developing countries. Countries like India has improved its ranking in Ease of Doing Business and inviting MNCs to invest in India and making India hub of production and manufacturing in the world. The advancement in technologies has also made the process of global integration more dynamic and virtual.

Due to information and technology the whole world is now integrating becoming a virtual village. Moreover, global integration has been seeing the era of proliferation of regional economic blocs, also known as Regional Trade Agreements (RTAs). Since 1980s and 1990s the RTAs have been growing very rapidly. Regional collaborations and agreements between nations are stepping stones for economic integration in various geographic region There are various trading bloc operating in this world since several decades. For example, European Union, European Free Trade Agreement (EFTA), North American Free Trade Agreement (NAFTA) etc. are trading bloc in developed countries. The benefits reaped by developed

countries due to Regional economic integration these trading blocs were also advocated in developing countries. ASEAN and SAARC are the most important trading blocs in South Asia. But slow progress and political indifferences in SAARC gave birth to a sub-regional economic cooperation organization BIMSTEC. The major trade blocs in the world are:

Table 1.1: Major Trading Blocs in World

Regions	Name of Trading Blocs
In Europe Region	• The European Union (EU), • The European Free Trade Agreement (EFTA) • The European Agreements • The European Economic Area (EEA)
In United State (US)	• North American Free Trade Agreement (NAFTA) • The Canada-US Free Trade Agreement (CUSTA) • The US Israel Free Trade Agreement.
In Asia	• The Association of Southeast Nations (ASEAN) • The ASEAN Free Trade Area (AFTA) • The Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) • SAARC (South Asia Association of Regional Cooperation) BIMSTEC (The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation).
In Latin America	• The Common Market of the South (MERCOSUR) • The Central American Common Market (CACM) • The Latin American Integration Association (LAIA) • The Caribbean Community and Common Market (CARICOM) in Sub-Saharan Africa, • West African Economic and Monetary Union, Customs and Economic Union of Central Africa • The Common Market of Eastern and Southern Africa (COMESA)/Preferential Trade Area for Eastern and Southern African States (PTA) • The Southern African Customs Union (SACU)

Source: World Trade Organization

2. About BIMSTEC

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization comprising of seven members namely India, Bangladesh, Sri Lanka, Thailand, Myanmar, Nepal and Bhutan. It was formed in Bangkok on 6 June 1997 and initially the name was BIST-EC (Bangladesh, India, Sri Lanka, and Thailand Economic Cooperation). Myanmar was admitted as a complete member at a Special Ministerial conference held in Bangkok on 22 December 1997. BIMSTEC was established with the objective to merge the 'Look West' policy of Thailand and ASEAN with the 'Look East' policy of India and South Asia. Therefore, BIMSTEC can be explained as an association among ASEAN and SAARC. The region is home to around 1.5 billion people which constitute around 22% of global population with a combined GDP of $3.5 trillion (2018) economies. BIMSTEC Member States have been able to sustain an average 6.5% of economic growth trajectory despite global financial crisis and meltdown since recent years.

The objective behind the formation of this organisation was to harness shared and accelerated growth through mutual cooperation in different areas of common interests by mitigating the onslaught of globalization and by utilizing regional resources and geographical advantages for mutual benefits. Unlike other regional groupings, BIMSTEC is a sector-driven cooperative organization embracing trade, technology, energy, transport, tourism and fisheries, agriculture, public health, poverty alleviation, counter-terrorism, environment, culture, people to people contact and climate change (www.bimstec.org).

BIMSTEC represent one of the most varied regions of the world, be it the way of life, religion, language, or culture. It contains developing nations as well as Least Developing Countries (LDCs) (Kaur, 2017).

The creation of BIMSTEC can be accredited to two things one is the breakdown of SAARC to form an energetic regional environment for trade and economic cooperation and second concern is ongoing procedure of liberalization of South Asian economies worried to find out latest markets in the ASEAN region as alternative of SAARC, whose scale is restricted due to non-economic aspect that is improbable to alter in the close future. BIMSTEC is a relatively young organization among the various regional and sub regional grouping (Upreti, 2007).

3. Review of Literature

Abouelfarag & Abed (2020) examined the impact of FDI and external debt (collectively) on growth and employment levels used a sectoral perspective in Egypt during the 1985–2014 period. The economic growth models included the aggregate model in which the time series ARDL model revealed that FDI had a weak positive effect on economic growth in the long run, while the effect of external debt was insignificant. The Granger causality test confirmed that FDI caused economic growth. A set of single-sector models showed that the effect of FDI on output was positive in the three service sub-sectors, i.e. financial, tourism and other services sectors, but insignificant in the agricultural, construction and manufacturing sectors.

Sharma & Kautish (2020) used the nonlinear autoregressive distributed lag bounds framework and unknown structural break, the study investigated the impacts of selected macroeconomic variables in driving FDI inflows in India during the study period 1979-2016. The proposed NARDL approach examines the impact of upside and downside movements of FDI determinants (i.e. GDP, consumption expenditure, exchange rate and globalization index) in India. The results of the proposed study suggested that in the long run, the downside movements in per capita income lead to a decrease in FDI, whereas the positive variations in per capita income are found to be insignificant for attracting FDI inflows in the country. However, in the case of private expenditure, both the upside and downside movements influence FDI inflows significantly and differently.

Shittu, Yusuf & Houssein (2020) measured the impacts of foreign direct investment (FDI), globalisation and political governance on economic growth in West Africa. The empirical analysis also included the interaction effect of political governance and FDI on the growth of the sub-region, over the period of 1996–2016. The study employed the autoregressive distributed lag technique on data obtained from the World Bank. The results suggest a positive relationship between globalisation and political governance on economic growth. Even though there have been inconclusive results on the FDI–growth nexus, the authors found that FDI stimulates the growth of the sub-region, while political governance enhances the positive impact of FDI on economic growth. The other factors of growth included are labour, capital and government size, whose effects on growth are, respectively, negative, negative and positive.

Kubendran (2020) explored trade relation between India and other BRICS nations in the short-run and long-run over the period 1991-2016. The author employed the Granger Causality test for short-run impact and Gravity Model using Dynamic Ordinary Least Square

(DOLS) and Fully Modified Ordinary Least Square (FMOLS) for long-run impact. Granger Causality test results strongly support India's trade with other BRICS nations. Long-run results from the Gravity model using DOLS and FMOLS found highly significant for the selected variables (GDP, PCGDP, PCGDPD, Exchange Rate, Trade-GDP ratio and Distance) other than inflation and trade agreement.

Al-Mihyari (2019) examined the impact of foreign direct investment on economic growth in Jordan for the period from 2000 to 2017. The author used ADF and PP test for stationarities and error correction model for short run relationship. The results obtained using the EViews program show that there is a positive effect of FDI flows on GDP in Jordan and that there is a positive correlation between FDI and economic growth in the short term represented by GDP. The study also showed a positive relationship between economic growth and trade openness. Moreover, there was an inverse relationship between gross fixed capital formation and domestic credit to the private sector and economic growth in the short term.

Chandio, Mirani & Shar (2019) investigated the causal relationship among Agricultural sector Foreign direct investment (FDIA) and economic growth in Pakistan over the period of 1991–2013. The study conducted several essential econometric techniques including PP and DF-GLS unit root tests, Johansen cointegration, ARDL, DOLS and VECM specified Granger causality approaches to understanding the source and direction of a possible causal association among FDIA and economic growth. The Johansen cointegration technique outcomes establish the existence of a long-run equilibrium linkage between FDIA and GDP series. The estimates of long-run based on the ARDL and DOLS show that FDIA has a strong positive significant impact on economic growth in Pakistan. While based on VECM Granger causality approach outcomes display that there was bidirectional short-run causality between FDIA and economic growth, bidirectional long-run causality among economic growth and FDIA.

Ibhagui (2019) examined the effect of foreign direct investment on growth in Sub-Saharan Africa (SSA). Six variables were used as thresholds – inflation, initial income, population growth, trade openness, financial market development and human capital. The analysis was based on a large panel data set that comprises 45 SSA countries for the years 1985–2013. The standard panel and threshold regression framework are used. The author found that FDI accelerates economic growth when SSA countries have achieved certain threshold levels of inflation, population growth, human capital and FMD, and this evidence was largely invariant and robust even after the consideration of endogeneity of FDI.

Mishra & Jena (2019) used one basic and four augmented versions of gravity model technique, the authors tried to examine the determinants of foreign direct investment (FDI) flows from some leading developed countries (the USA, Japan, Germany, the Netherlands, the UK and France) into major four Asian economies (China, Korea, India and Singapore). The study used World Development Indicators data for period 2001–2012. The results revealed that besides the market size for host and source country, other criteria such as distance, common language and common border also influence foreign investors. Other macroeconomic factors such as inflation rate and real interest rate are among the key factors that attract more FDI. The negative sign of the macroeconomic stability variables, namely, inflation rate and interest rate indicate that the major Asian economies were not able to manage their monetary policy and administer their financial stability well.

Nantwi & Erickson (2019) investigated the impact of foreign direct investment on economic growth in a panel dataset of 10 countries in South America for the period 1980 - 2015. The study further examines the causal relationship between foreign direct investment and economic growth in both the short-run and long run respectively. Using Pedroni cointegration test and vector error correction model, the study finds that foreign direct investment has a positive significant effect on growth. Additionally, the study finds that domestic capital, trade and population growth is positively related to economic growth in South America. Government consumption expenditure and inflation negatively relate to economic growth in South America; however, government consumption is not statistically significant.

Sengupta & Puri (2019) analysed foreign direct investment (FDI) inflows have been a trigger for accelerating economic growth in a number of countries. This study attempted to study the pattern of FDI into the Indian subcontinent and India's neighbours, such as Pakistan, Nepal, Bangladesh and Sri Lanka, and explore the causality between FDI and gross domestic product (GDP). The authors used time-series data from 1981 to 2015 for regression. The results show that there is an association between FDI and GDP, and in all the cases, FDI is instrumental in enhancing the economic growth of the countries except for Pakistan. In case of Pakistan, Granger causality test suggests that FDI does not cause GDP.

Uddin and Sarntisart (2019) investigated the causal effects of human capital inequality and economic growth using sub-national annual data from Thailand. Thailand Labour Force Survey has been used to generate provincial average years of schooling and Gini coefficient of years of schooling for the years 1995–2012. The authors used unit root test with CSD and cointegration test with CSD. The estimated parameters of human capital inequality are found similar and significantly negative at 5 percent level, which implies that there are negative

effects of distribution of human capital on aggregate economy. However, the effect of average years of schooling is insignificant. Thus, the findings of the paper suggest that human capital inequality hinders economic growth in Thailand.

Anetor (2018) analysed the effect of shocks in the various components of private capital inflows on economic growth in Nigeria. The used quarterly data of Real GDP, FDI inflows, FPI inflows and Personal remittances received (PRR) over the periods of 1986Q1–2016Q4 using impulse response (IRF) and the structural vector to regression SVAR model. Findings from the IRF showed that FDI inflows exert a positive impact on economic growth. It was also found that portfolio investment flows have a positive impact on the growth of the Nigerian economy.

Belloumi & Alshehry (2018) analysed the causal links between domestic capital investment, FDI, and economic growth in Saudi Arabia over the period 1970–2015 by using the ARDL bounds testing to cointegration approach. The FMOLS and DOLS are employed to check the robustness of the ARDL long run estimates. The authors find that the results are the same for the different estimation techniques. The results show that in the long term there are negative bidirectional causality between non-oil GDP growth and FDI, negative bidirectional causality between non-oil GDP growth and domestic capital investment, and bidirectional causality between FDI and domestic capital investment. FDI affects negatively domestic capital investment in the short run whereas domestic capital investment affects negatively FDI in the long run.

Mowlaei (2018) investigated empirically the impacts of Foreign direct investment (FDI), personal remittances (PR) and official development assistant (ODA) on economic growth of 26 top host African countries over the period 1992–2016 by Pooled Mean Group (PMG) estimator. The author also used panel unit root test and panel co-integration test All the three forms of FCIs used in this study affect economic growth in the studied African countries positively and statistically significant in the long- and short-run. However, PR had more impact than FDI and ODA on economic growth of 26 African countries over the study period.

Rahman, Rana, Barua (2018) examined the influence of energy consumption, gross capital formation, remittance inflow, international trade, FDI, and government consumption expenditure on the economic growth of selected South Asian countries where panel data for the period of 1975 to 2016 are used. In the analysis, both static (Panel cointegration standard error) and dynamic (one step system GMM) panel estimation techniques have been employed. According to the estimated results, energy consumption has a positive and significant effect on the economic growth of South Asian countries, and the extent of the

effect of this variable is enormous. Moreover, gross capital formation and increasing inflow of remittance are also the key drivers of growth. However, international trade, FDI and government consumption expenditure are not found significant to explain the economic development in South Asia.

Saini & Singhania (2018) investigated the potential determinants of FDI, in developed and developing countries. FDI inflows have been categorized under two heads: horizontal (market seeking) and vertical (resource seeking/efficiency seeking) investment. The panel of 20 developed and developing countries is analysed, and the author found that efficiency scores play a significant role in explaining the behaviour of FDI inflows in developed and developing countries. The significance of economic freedom is observed in developed countries only. The static models of developed countries support market-seeking hypothesis where GDP and freedom index are positively related to FDI, and the results of dynamic model support market-seeking as well as resource/efficiency-seeking hypothesis where GDP growth, freedom index, and efficiency scores are among the major determinants of FDI.

Ali & Mna (2017) show how foreign direct investment (FDI) affect domestic investment and economic growth of three developing countries i.e. Tunisia, Algeria and Morocco. The authors used the generalized moments method (GMM) for analysis. The results reveal that ID is a positive and significant coefficient in the growth equation, credibly transferring the effects of domestic savings and credit to national value added (GDP). On the other hand, for the case of Morocco, ID does not have a significant weight in growth. The knowledge and qualifications internal and imported in Morocco occupy the position in favour compared to Tunisia and Algeria.

Adhikary (2017) investigated the macroeconomic determinants of foreign direct investment (FDI) for the top five South Asian economies, and to examined whether these factors are the same for each. The study employed fully modified ordinary least squares and two-stage least squares estimation methods. The results show that South Asian economies have a number of FDI determinants in common. For example, market size and human capital are the two most common factors attracting FDI in each country except for Nepal, which revealed a negative correlation between FDI and market size. The results reveal that no unequivocal set of FDI determinants exists for the countries of South Asia. The fundamental reasons for this could be that South Asian countries differ from one to another with respect to their socioeconomic developments, incentives for FDI, bureaucratic hassles, and bilateral treaties with countries that supply FDI, even though they all adopted a market-led economic growth model at more or less the same time in the early 1990s.

Durmaz (2017) examined the determinants of foreign direct investment, and concentrate on the linkage between democracy and foreign direct investment in Turkey. The cointegration analysis with an ARDL approach reveals that democracy is an important factor in multinational corporations' decisions for choosing Turkey as a potential investment site. The developing Turkish economy has attracted more FDI flows over time as democracy has improved in terms of civil freedom and political rights.

Shevelova & Plaskon (2017) analysed inflows of FDI (IFDI) and facilitate economic growth with a particular focus on absorptive capacity factors, such as the potential of human resources to absorb innovation and benefit from research and development (R&D) expenditure. To estimate the effects of IFDI on Ukrainian economic growth, a Cobb-Douglas production function is used. The Generalized Method of Moments (GMM) model indicates that R&D expenditure benefited very significantly in evolving country's innovation system due to economic growth. Physical and human capital has not been used effectively in Ukraine to facilitate economic growth and attract IFDI. The number of patents is not significant in all of the regression models. Moreover, IFDI in Ukraine for the 1996–2015 period did not significantly impact on economic growth. However, the absorptive capacity of human capital, in particular those with a higher education, is relatively relevant to benefit from IFDI.

Gupta & Singh (2016) investigated the causal nexus between FDI and GDP, Johansen cointegration technique is employed, followed by VECM and standard Granger causality test. The Johansen cointegration result establishes a single cointegrating vector (long run relationship) between FDI and GDP for Brazil, India and China. After proving a cointegration, VECM results revealed unidirectional long run causality running from GDP to FDI in case of Brazil, India and China. It is confirmed that there also exists short run causality between FDI and GDP in China. However, for Russia and South Africa, where there is no cointegration in the long run, standard Granger causality test is conducted, which reveals that in both the nations, FDI and GDP are independent of each another.

Mahembe (2016) examined the causal relationship between inward foreign direct investment and economic growth in SADC countries over the period 1980-2012. The study divided the SADC countries into two groups, namely, the low-income and the middle-income countries. The author used recently developed panel-data analysis methods to examine the causal relationships. The Granger causality test for middle-income countries was conducted within a VECM framework, while for lower income countries was conducted within a VAR framework. Panel Granger causality results for the low-income countries showed no evidence

of causality in either direction. However, for the middle-income countries' panel, there was evidence of a uni-directional causal flow from GDP to FDI, and not vice versa.

Azam & Ahmed (2015) investigated how far investment in Human Capital and the availability of FDI have contributed toward economic growth of ten countries of Commonwealth Independent States. Using sufficiently long series of panel data, the study applied the fixed-effects and random-effects models where the Hausman test favoured the use of the fixed-effects model. The results support the hypothesis of the study by confirming that Human capital development is critical for economic growth. Empirical results reveal that education has a positive impact on economic growth. Similarly, results of Human Capital captured through life expectancy proxy for health had a positive effect on economic growth. The statistically weak positive effect of FDI on economic growth to uncertainty and initial economic disturbances in the newly independent states.

Chaudhry & Mehmood (2015) find out the relationship between FDI and economic growth as well as the impact of Foreign direct investment (FDI) on economic growth. The study used secondary data obtained from Would Development Indicators over the period 1985-2009. The ARDL approach is estimated along with the ECM, to find out the short- and long-run relationship between the variables after checking their stationarity through the ADF approach to the unit root test. The finding of this study reveals that there is long-run relationship between variables.

Pegkas (2015) investigated the relationship between FDI and economic growth and to estimate the effect of FDI on growth of the Eurozone 18 countries over the period 2002–2012. The author used 1st differencing to convert data from non-stationary into stationery and panel cointegration test on FDI and GDP. By using the Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS) methods the empirical analysis reveals that there is a positive long-run cointegrating relationship between FDI stock and economic growth. Also, fixed and random country effects estimation methods show that the stock of foreign direct investment is a significant factor that positively affects economic growth in the Eurozone countries.

Rehman (2015) used panel data from 1970 to 2012 to investigate the relationship between FDI and economic growth. The author used GDP per capita, FDI, Literacy rate and exports data from UNCTAD. The Vector error correction model (VECM) results suggest that FDI depends on the economic growth but this relationship is not true vice-versa. The second model showed that FDI, human capital and exports determined the economic growth of Pakistan. However, the poor human capital reduced the economic growth and FDI.

Rahman (2015) evaluated the impact of Foreign Direct Investment (FDI) on the economic development of Bangladesh. The author conducted statistical analyses of the relationships between FDI and its impact on selected macroeconomic indicators such as Gross Domestic Product, Inflation Rate, and Balance of Trade over the period of 1999 to 2013. Multiple Regression Analyses were utilized to measure the relationship between independent (FDI) and dependent variables (macroeconomic indicators). The statistical findings exhibited an insignificant positive correlation between FDI and GDP growth, a strong positive correlation between FDI and inflation rate, and a strong negative correlation between FDI and BOT. The author also recommended, future research should be focused on finding a causal relationship between FDI and economic growth in Bangladesh.

Seyoum & Lin (2014) examined the causal relationship between trade openness and FDI for sub- Saharan African region based on a sample of 25 African countries over the period 1977-2009. The authors took advantage of recent developments in econometric testing techniques for Granger noncausality heterogeneous panels that takes into consideration the effects of cross section dependence across the units of the panel data set to analyse the trade–FDI nexus in the region. The Granger causality indicated bidirectional causality between trade and FDI for sub-Saharan economies. The results suggested that countries at the early stage of economic development attracted factor-seeking inward FDI.

Alam (2013) employed a tri-variate approach in order to find out causality and comparative relationships between electric power consumption, FDI and economic growth for India and Pakistan. Granger causality tests and error correction mechanism were implemented in order to check short- and long-run causalities between the three variables. The study did not approve the existence of any short-run causality relationships between the three variables for both the countries. In the long run, electric power consumption granger causes both economic growth and FDI for India. whereas bi-directional relationship was estimated for FDI and economic growth. In the case of Pakistan, FDI and economic growth were observed to cause electric power consumption in the long run.

Kaur, Yadav & Gautam (2013) Used Toda-Yamamoto granger causality technique, the authors tried to examine the causal relationship between economic growth and foreign direct investment (FDI) in context of India. The period of study was divided into 2 parts i.e.1975-1990 named as pre-liberalization period and 1991-2009 named as post-liberalization period. The data is tested for stationarity using Augmented Dickey-Fuller test and Phillips Peron test. Authors also examined the co-integration properties using Johansen test to identify long run relationship between the two variables. The results of Granger causality clearly indicate that

there was an evidence of FDI led growth for both of the periods chosen for the study. Also, there was strong evidence of growth causing FDI after liberalization.

Sultan (2013) examined the nature of relationship between export and FDI in India using VECM technique of determining causality. The result of Granger causality based on vector error correction model (VECM) shows that causality runs from export to FDI inflow direction and not from FDI inflow to export direction. The study also found that there was one cointegration relation between the variables implying that FDI and export has long run relationship. The VECM result shows that there is unidirectional causal relation from export to FDI direction and not from FDI to export direction.

Islam, Hye & Shahbaz (2012) examined the causal relationship between economic growth and imports in 62 countries using an ARDL approach to cointegration and modified Granger causality test. The results suggested that imports play an important role in economic growth process. On the other hand, economic growth also plays vital role to finance imports. The results of modified Granger causality test indicate the mix results but the important is that in the case of higher income countries there is unidirectional long-run causality from imports to economic growth (except the USA, Iceland and Italy), and in the case of low income countries there exists a bidirectional long-run causal relationship between imports and economic growth (except Madagascar and Mauritania).

Adegbite & Ayadi (2011) investigated the relationship between foreign direct investment flows and economic growth in Nigeria. The data of real GDP growth rate, labour productivity growth rate, growth of real capital stock, total factor productivity growth rate, volume of trade and FDI growth rate obtaining from the Economist Intelligence Unit (EIU) (2008) country Data – Annual time series over the period 1992-2007. The authors used Jarque-Bera test and Lagrange-Multiplier test. The study confirmed the beneficial role of FDI in growth. However, the role of FDI on growth could be limited by human capital.

Srinivasan, Kalaivani & Ibrahim (2011) investigated the casual relationship between foreign direct investment (FDI) and economic growth in SAARC countries. Johansen cointegration technique followed by the Vector Error Correction Model (VECM) was employed to investigate the causal relationship between variables. The Johansen cointegration result establishes a long run relationship between foreign direct investment and GDP for the sample SAARC countries. The empirical results of VECM exhibit a long-run bidirectional causal link between GDP and FDI for the selected SAARC countries except India. The test results show that there is a one-way long-run causal link runs from GDP to FDI for India.

Iqbal, Shaikh & Shar (2010) investigates the causality relationship between FDI, Trade Economic growth in Pakistan using quarterly time series data from 1998 to 2009. The VECM framework used to test the causality relationship between the variables. In VAR model, the integration and cointegration analysis suggested that there is a long run relationship among the factors. The results of VECM causality test find bidirectional causality between foreign direct investment, export and economic growth. Moreover, Foreign Direct Investment has positive impact on the trade growth in Pakistan.

Andraz & Rodrigues (2009) tests the causal relationship among exports, FDI and economic growth in Portugal and identify their direction from 1977 to 2004. The authors used Vector error correction model (VECM) and Granger causality test for the direction of causality. The results provide important insight into the causality nexus among variables in both the long and the short-run. There is evidence of a positive relationship among exports, FDI and economic growth. In the long-run, data support the export-led growth hypothesis and the FDI-led growth hypothesis. The importance of FDI to economic performance is also stated in the short-run. There is a significant bi-directional relationship between FDI and economic growth and Granger-causal relationship running from FDI to real exports.

Miankhel, Thangavelu & Kalirajan (2009) adopted a time-series framework of a vector autoregressive model to examine the relationship between export, FDI and GDP growth among the selected emerging countries over the period of 1970-2005. The Ganger causality test with VECM are used for the direction of causality. The Latin American countries of Mexico and Chile show a different of relationship in the short run but in the long run, exports affect the growth of FDI and output. In the case of East Asian countries, the authors find bi-directional long run relationship among exports, FDI and GDP in Malaysia, while we a long run uni-directional relationship from GDP to export for Thailand.

Sarkar (2007) examine the relationship between growth and FDI the study analysed panel (1981-2002) and time-series (1970-2002) data for 51 Least Development Countries. The author used per capita GDP, FDI and trade (export plus import) as variables. The panel data analysis observed a rising relationship between growth and FDI only for the group of 16 countries having high GDP per capita and high trade-dependence. Time-series analysis of individual country cases concludes that only for ten countries it can be clearly said that the share of FDI in their gross capital formation has a long-term positive relationship with the growth of per capita income. There are also four clear cases of negative relationship. In the majority of country cases we observe no long-term relationship between FDI share and

growth irrespective of whether these countries are closed or open and poor or rich compared to the countries experiencing a positive long-term relationship.

Al-Iriani & Al-Shamsi (2007) explore the direction of interaction between FDI and economic growth in the GCC countries using a panel cointegration framework. The time series data at the country level have been traditionally used. In this article, the authors adopt a different approach to test the FDI-GDP relationship. The study used heterogeneous-panel cointegration and causality techniques to test for the possibility of causality running from FDI to GDP. In addition, it is test for the possibility of reverse causality running from GDP to FDI. The results suggest that there is a positive correlation between FDI inflows and growth in a bidirectional way. In addition, to the GMM estimators a strong causal link from FDI to GDP and vice versa.

Mun & Lin (2008) study the relationship between FDI and economic growth in Malaysia for the period 1970-2005 using time series data. Ordinary least square (OLS) regressions and the empirical analysis are conducted by using annual data on FDI and economy growth in Malaysia. The authors used Gross National Income as dependent variable. The analysis shows that there is a positive relationship between the FDI and economic growth.

Ali & Asgher (2006) estimated the impact of sector-wise inflow of FDI on the economic growth while using the panel data on five geographically connected countries over time period of 2000-15. FDI has long been considered as an important variable for the growth of a country as it provides the necessary capital for the economic and business activities. The authors applied Hausman test to deduce which model between the Fixed Effects Model and Random Effects Model should be used for estimation. The result suggests that FDI in manufacturing sector has the significant positive impact with the highest coefficient relative to other sectors the economy due to high marginal returns. The impact of agriculture sector is minor though significant while, FDI in service sector is not significantly affecting the economic growth.

Frimpong & Abayie (2006) test the direction of causality between foreign direct investment inflows and economic growth (GDP growth) for Ghana focusing mainly on the pre- and post-SAP periods. Annual time series data covering the period 1970-2002 was used. The empirical findings based on the Toda-Yamamoto Granger causality test clearly suggest for the pre-SAP period of 1970-1983, there is no evidence of either Growth driven FDI or FDI-led growth. Concerning the results for the post-SAP period, i.e. 1984-2002, the authors found out evidence of FDI-led growth. The study, however, still failed to confirm Growth-driven FDI, i.e. GDP growth in Ghana has not been attracting FDI inflows.

Lensink & Morrissey (2006) contributes to the literature on FDI and economic growth, by incorporating effects due to the volatility of FDI inflows. The authors used regression and OLS methods on the data of GDP, FDI and volatility over the period 1975-1997. The results suggested that FDI has a positive effect on growth, although this result is somewhat weaker for developing countries, whereas volatility of FDI has a significant negative impact. Volatility of FDI is an important negative influence on growth, but is not as important a determinant of growth as other factors such as the level of FDI and initial income. The authors find reasonably robust evidence to support our hypothesis that FDI volatility has a direct negative effect on growth.

Gunaydin & Tatoglu (2005) investigate the causal relationship between FDI and economic growth in Turkey based on annual data for the period of 1968-2002. The Augmented Dickey-Fuller test was applied to examine the non-stationarity of data. Johansen cointegration test results indicated that FDI and economic growth were cointegrated and that the relationship between both variables was positive and statistically significant. Empirical evidence from Granger causality test suggests that there is a strong evidence of a bi-directional causality between the two variables, supporting the feedback hypothesis for Turkey over this sample period.

Dritsaki, Dritsaki & Adamopoulos (2004) examine the relationship between exports, economic growth and foreign direct investments using annual data for the period 1960- 2002. The empirical analysis suggested that all variables that used in this study present a unit root. The Johansen cointegration test was used to check a long-run equilibrium relationship among these variables. Then the methodology of error correction model was applied to estimate the short-run and the long-run relationships. The Granger causality test infer that there is a bilateral causal relationship between exports and economic growth, while there is a unidirectional causal relationship between foreign direct investments and economic growth and also a unidirectional causal relationship between foreign direct investments and exports.

Reichert & Weinhold (2001) used a panel of 24 developing countries from 1971 to 1995 to analyze the dynamic relationship between FDI and economic growth. The authors examine the contemporaneous correlation of FDI and GDP growth and check for evidence of Granger causality between FDI and growth. The results from the MFR estimation of the causal relationship between FDI and growth in developing countries differ substantially from traditional panel data causality results. In particular, while traditional tests seem to suggest a uniform impact on growth from FDI, this study find that the causal relationship between

investment, both foreign and domestic, and economic growth in developing countries is highly heterogeneous.

Table 1.2: Summary of Literature Review

Name of Countries	Number of Studies
Developed Countries	05
India	02
Pakistan	04
BRICS	02
Nigeria	02
SAARC	01
West Africa	02
Latin America	02
SADC	01
GCC	01
SSA	02
Saudi Arabia	01
Turkey	01
Jordan	02
African Countries	01
China	02
3 countries of South Asia	04
5 countries of South Asia	03

4. Research Gap

From the literature reviewed above, it can be said that most of the studies examining the relationship between FDI and economic growth were studied on developed countries. Moreover, the role of factors driving the FDI and its contribution to Economic Growth of economies varies country to country and region to region. The impact of Foreign Direct Investment (FDI) on economic growth is a highly debated subject in academia. Some experts argue that there is a strong positive relationship between FDI and economic growth (Mengistu & Adams, 2007). It has been suggested that FDI is vital to facilitate capital formation for developing countries, to transfer knowledge and technology, and to create employment which might have a direct affirmative impact on economic growth (Al-Iriani & Al-Shamsi, 2009).

On the other hand, some researchers indicate that FDI might have a negative impact on economic development of the recipient country (Rahman, 2015). Some researcher argues that FDI has decreased the rate of national saving, domestic investment and economic growth in several developing nations. A third view suggests that no impact of FDI on Economic Growth.

Developing countries are largely neglected in this context. However, some empirical studies were conducted on South Asian region but no empirical study has been conducted on BIMSTEC region (Table 1.2). Most of literature reviews, focused on various issues of BIMSTEC such as political issues, issues related to economic cooperation and agreement among member states and regional problems of member countries etc. Before 1990s South Asian economies usually adopted the model of closed economy, but after 1990s these countries have liberalized their policies to reap the benefits associated with globalizations and foreign direct investment. Hence the positive and open-door policies followed by these countries are in great contrast to their earlier adopted restrictive approaches. Due to British colorism, South Asian economies have criticized the foreign investment in early decades. Despite this fact, some member states of BIMSTEC region are receiving significant amount of FDI since several years. Therefore, it is crucial to examine the relationship between foreign direct investment and economic growth. In addition, the pattern of FDI in BIMSTEC region and benefits of FDI to economic growth to BIMSTEC region has never been analyzed empirically. Therefore, present study is a humble attempt to analyze the trend of FDI inflows in BIMSTEC region and its relationship with economic growth of this region.

From the above discussion, it is clear that experts are sharply divided on the impact of FDI on the economic development of the host country. This study attempts to determine whether FDI has a significant impact on economic growth by examining empirical evidence from BIMSTEC region.

5. Objectives of the Study

The main objectives of this study are as follows:

1. To study the trade performance of BIMSTEC nations.
2. To analysis the trends of Foreign Direct Investment in BIMSTEC nations.
3. To examine the relationship among Foreign Direct Investment, Trade and Economic Growth in BIMSTEC nations.
4. To suggest policy implications in the field of Foreign Direct Investment, Trade and Economic Growth of BIMSTEC nations.

6. Hypothesis

Ho There is no significant relationship among Foreign Direct Investment, Trade and Economic Growth in BIMSTEC Nations.

H_1 There is significant relationship among Foreign Direct Investment, Trade and Economic Growth in BIMSTEC Nations.

7. Research Methodology

7.1 Variables & Data

The data set will be collected for the purpose of the study through secondary methods. Most probable variables will be used in the study are GDP per capita, FDI Inflows, Exports, Imports, Inflation Rate, Unemployment Rate etc. The annual time series data of Trade (Exports, Imports), GDP per capita (as proxy for economic growth) and FDI inflows will be taken from various websites and reports of Reserve Bank of India, IMF, Department of Industrial Policy and Promotion (DIPP), and World Bank. GDP per capita is a good proxy for economic growth because it is a relative measure depicting GDP in relation to population of the country.

7.2 Statistical Tools

Various statistical tools like Compound Annual Growth Rate (CAGR), T-test, Augmented Dickey Fuller Test, Philips Peron Test, Co-integration test and Ganger Causality Test will be applied. Moreover, relevant econometries and statistical tools will be applied as per data suitability.

CAGR

Compound annual growth rate (CAGR) is the rate of return that would be required for an investment to grow from its beginning balance to its ending balance, assuming the profits were reinvested at the end of each year of the investment's lifespan. CAGR is one of the most accurate ways to calculate and determine returns for anything that can rise or fall in value over time.

To calculate the CAGR of a variable:

1. Divide the value of a variable at the end of the period by its value at the beginning of that period.
2. Raise the result to an exponent of one divided by the number of years.
3. Subtract one from the subsequent result.

The formula for calculating CAGR is as follows:

CAGR = [(Ending value/Beginning Value) ^(1/N)]-1

T-test

T-test tells how significant the difference between two groups are. It tells if the differences are due to chance or not.

Moving Average

It helps in smoothing out the series by creating out a constantly updated series. By calculating the moving average, the impact of random, short-term fluctuations on a series over the different subsets of the full data sets are mitigated. A simple moving average is calculated by taking the arithmetic mean of a series over the specified period of time.

ADF Test

Augmented Dickey-Fuller test is a test of unit root and stationarity. A time series is said to be stationary if mean and variance do not vary over time. Therefore, to avoid non-sense regression, unit root test is conducted to check whether the series is stationary or not.

Cointegration Test

Two or more variables are cointegrated if they move together in long-run. In other words, two variables will be cointegrated if they have a long-term, or equilibrium relationship between them. Regression of a nonstationary time series on another non stationary time series may produce a spurious regression. Therefore, a test for cointegration can be thought as a pre-test to avoid 'spurious regression'. (Gujarati, 2012).

Granger Causality Test

Granger causality is a very popular test to examine lead-lag relationship between the variables. Causality may be unidirectional and bi-directional. According to Granger causality, if a series X "Granger-causes" (or "G-causes") another series Y, then past values of X should contain information that helps predict Y above and beyond the information contained in past values of Y alone.

7.3 Time Period

The data set will be collected for the purpose of the study through secondary methods. The tentative data period will be from 1980-2020.

8. Relevance of the Study

The analysis of trade performance of BIMTEC countries would help to determine the trend of export & import and to make for forecasting for future performance of trade of these economies. This study is of great relevance to the governments of these selected BIMSTEC countries as it gives a concise presentation of the effects of foreign capital flows in each country based on the structural differences and contextual background of each country. The results obtained are discussed based on the context of each specific country and therefore policy recommendations are made based on country specific needs. This helps the government to focus on developing targeted policies that will benefit its unique economy and lead to

sustainable economic growth. This would also benefit other countries with similar issues as it would serve as a learning point for them.

9. Organisation of the Study

Chapter I: Introduction: The first chapter will include the introductory part of the study.

Chapter II: Review of Literature: The second chapter elaborates literature review and the purpose of the study.

Chapter III: Research Methodology: The third chapter will be related with research methodology of the study.

Chapter IV: Analysis and Interpretation of the Data: The fourth chapter will be related with the analysis and interpretation of the data.

Chapter V: Finding and Conclusion: The fifth chapter will cover the research finding, suggestions, conclusion of the study, policy implications and future research directions.

10. References

Abouelfarag, H. A., & Abed, M. S. (2019). The impact of foreign capital inflows on economic growth and employment in Egypt. *Journal of Economic and Administrative Sciences*.

Adegbite, E. O., & Ayadi, F. S. (2010). The role of foreign Direct Investment in economic development: A study of Nigeria. *World Journal of Entrepreneurship, Management and Sustainable Development*.

Adhikary, B. K. (2017). Factors influencing foreign direct investment in South Asian economies. *South Asian Journal of Business Studies.*

Alam, A. (2013). Electric power consumption, foreign direct investment and economic growth. *World Journal of Science, Technology and Sustainable Development*.

Ali, H., & Asgher, M. T. (2016). The Role of the Sectoral Composition of Foreign Direct Investment on Economic Growth: A Policy Proposal for CPEC and Regional Partners. *The Pakistan Development Review*, 89-103.

Ali, W., & Mna, A. (2019). The effect of FDI on domestic investment and economic growth case of three Maghreb countries. *International Journal of Law and Management*.

Al-Iriani, M. (2007). Foreign direct investment and economic growth in the GCC countries: A causality investigation using heterogeneous panel analysis. *Topics in Middle Eastern and North African Economies, 9.*

Al-Mihyawi, S. N. (2019). Impact of Foreign Direct Investment on Economic Growth in Jordan. *Journal of Administration and Economics*, (119), 77-94.

Andraz, J. M., & Rodrigues, P. M. (2010). What causes economic growth in Portugal: exports or inward FDI?. *Journal of Economic Studies*.

Anetor, F. O. (2019). Economic growth effect of private capital inflows: a structural VAR approach for Nigeria. *Journal of Economics and Development*.

Azam, M., & Ahmed, A. M. (2015). Role of human capital and foreign direct investment in promoting economic growth. *International Journal of Social Economics*.

Belloumi, M., & Alshehry, A. (2018). The impacts of domestic and foreign direct investments on economic growth in Saudi Arabia. *Economies*, *6*(1), 18.

Bermejo Carbonell, J., & Werner, R. A. (2018). Does foreign direct investment generate economic growth? A new empirical approach applied to Spain. *Economic geography*, *94*(4), 425-456.

Chandio, A. A., Mirani, A. A., & Shar, R. U. (2019). Does agricultural sector foreign direct investment promote economic growth of Pakistan? Evidence from cointegration and causality analysis. *World Journal of Science, Technology and Sustainable Development*.

Chaudhry, N. I., Mehmood, A., & Mehmood, M. S. (2013). Empirical relationship between foreign direct investment and economic growth. *China Finance Review International*.

Durmaz, N. (2017). Foreign direct investments, democracy, and economic growth in Turkey. *International Journal of Social Economics*.

Frimpong, J. M., & Oteng-Abayie, E. F. (2006). Bivariate causality analysis between FDI inflows and economic growth in Ghana.

Gunaydin, I., & Tatoglu, E. (2005). Does foreign direct investment promote economic growth? Evidence from Turkey. *Multinational Business Review*, *13*(2), 89.

Gupta, P., & Singh, A. (2016). Causal nexus between foreign direct investment and economic growth. *Journal of Advances in Management Research*.

Har, W. M., Teo, K. L., & Yee, K. M. (2008). FDI and economic growth relationship: An empirical study on Malaysia. *International Business Research*, *1*(2), 11-18.

Ibhagui, O. (2020). How does foreign direct investment affect growth in sub-Saharan Africa? New evidence from threshold analysis. *Journal of Economic Studies*.

Iqbal, M. S., Shaikh, F. M., & Shar, A. H. (2010). Causality relationship between foreign direct investment, trade and economic growth in Pakistan. *Asian Social Science*, *6*(9), 82.

Islam, F., Hye, Q. M. A., & Shahbaz, M. (2012). Import-economic growth nexus: ARDL approach to cointegration. *Journal of Chinese Economic and Foreign Trade Studies*.

Kaur, M., Yadav, S. S., & Gautam, V. (2013). A bivariate causality link between foreign direct investment and economic growth. *Journal of International Trade Law and Policy*.

Kumari, R., & Sharma, A. K. (2017). Determinants of foreign direct investment in developing countries: a panel data study. *International Journal of Emerging Markets*.

Lensink, R., & Morrissey, O. (2006). Foreign direct investment: Flows, volatility, and the impact on growth. *Review of International Economics*, *14*(3), 478-493.

Mahembe, E. E., & Odhiambo, N. M. (2016). Does foreign direct investment cause economic growth? A dynamic panel data analysis for SADC countries. *International Journal of Emerging Markets*.

Miankhel, A. K., Thangavelu, S. M., & Kalirajan, K. (2009). Foreign direct investment, exports, and economic growth in South Asia and selected emerging countries: a multivariate VAR analysis. *Center for Contemporary Asian Studies. CCAS Working paper*, *23*.

Mishra, B. R., & Jena, P. K. (2019). Bilateral FDI flows in four major Asian economies: a gravity model analysis. *Journal of Economic Studies*.

Mowlaei, M. (2018). The impact of foreign capital inflows on economic growth on selected African countries. *African Journal of Economic and Management Studies*.

Nair-Reichert, U., & Weinhold, D. (2001). Causality tests for cross-country panels: a New look at FDI and economic growth in developing countries. *Oxford bulletin of economics and statistics*, *63*(2), 153-171.

Owusu-Nantwi, V., & Erickson, C. (2019). Foreign direct investment and economic growth in South America. *Journal of Economic Studies*.

Pegkas, P. (2015). The impact of FDI on economic growth in Eurozone countries. *The Journal of Economic Asymmetries*, *12*(2), 124-132.

Rahman, A. (2015). Impact of foreign direct investment on economic growth: Empirical evidence from Bangladesh. *International Journal of Economics and Finance*, *7*(2), 178-185.

Rahman, M. M., Rana, R. H., & Barua, S. (2019). The drivers of economic growth in South Asia: evidence from a dynamic system GMM approach. *Journal of Economic Studies*.

Rehman, N. U. (2016). FDI and economic growth: empirical evidence from Pakistan. *Journal of Economic and Administrative Sciences*.

Saini, N., & Singhania, M. (2018). Determinants of FDI in developed and developing countries: a quantitative analysis using GMM. *journal of economic studies*.

Saleem, H., & Shabbir, M. S. (2020). The short-run and long-run dynamics among FDI, trade openness and economic growth: using a bootstrap ARDL test for co-integration in selected South Asian countries. *South Asian Journal of Business Studies*.

Sarkar, P. (2007). Does foreign direct investment promote growth? Panel data and time series evidence from less developed Countries, 1970-2002.

Sengupta, P., & Puri, R. (2020). Exploration of relationship between FDI and GDP: A comparison between India and its neighbouring countries. *Global Business Review*, *21*(2), 473-489.

Sharma, R., & Kautish, P. (2020). Examining the nonlinear impact of selected macroeconomic determinants on FDI inflows in India. *Journal of Asia Business Studies*.

Shevelova, S., & Plaskon, S. (2018). Is the Ukrainian economy's absorptive capacity appropriate to attract foreign direct investment and facilitate economic growth?. *International Journal of Emerging Markets*.

Shittu, W. O., Yusuf, H. A., El Houssein, A. E. M., & Hassan, S. (2020). The impacts of foreign direct investment and globalisation on economic growth in West Africa: examining the role of political governance. *Journal of Economic Studies*.

Srinivasan, P., Kalaivani, M., & Ibrahim, P. (2011). An empirical investigation of foreign direct investment and economic growth in SAARC nations. *Journal of Asia Business Studies*.

Sultan, Z. A. (2013). A causal relationship between FDI inflows and export: The case of India. *Journal of Economics and Sustainable Development*, *4*(2), 1-9.

Uddin, M. N., & Sarntisart, S. (2019). Human capital inequality and economic growth: evidence with sub-national data from Thailand. *International Journal of Social Economics*.

https://economictimes.indiatimes.com/topic/BIMSTEC (accessed dated 07 June 2019)

https://economictimes.indiatimes.com/news/politics-and-nation/government-invites-bimstec-leaders-for-swearing-in-ceremony-on-may-30/articleshow/69524582.cms (accessed dated 28 May 2019)

https://economictimes.indiatimes.com/news/politics-and-nation/bimstec-invite-indicates-india-shaping-alternative-regional-platform-former-indian-diplomat/articleshow/69581485.cms (accessed dated 30 May 2019)

https://www.hindustantimes.com/india-news/what-is-bimstec-and-why-is-it-important-for-india/story-SPT8asnufTPmW1kxG5PLaP.html (accessed dated Aug 2018)

https: bimstec.org

Approval sheet

Signature of Supervisor
(Dr. Vijender Pal Saini)

Signature of Student
(Mr. Ravinder)

Signature of Director
(With official seal)